Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-23 are pending in the application, with claims 1 and 14 being the independent claims. By the foregoing amendment, claims 1-4, 9-17, 20, 22, and 23 are sought to be amended. These changes are believed to introduce no new matter and raises no new issues requiring further consideration or search. Furthermore, these amendments place the application in a better from for allowance or appeal. Accordingly, their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding rejections and that they be withdrawn.

Rejections Under 35 U.S.C. § 103

Cohn in View of AAPA

Claims 1 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,712,995 to Cohn (hereinafter "Cohn") in view of Applicant's Admitted Prior Art (hereinafter "AAPA"). (*See*, Office Action at p. 2.) Applicant respectfully traverses these rejections.

Amended independent claim 1 (emphasis added) recites:

A method for spatially compositing digital video images with a tile pattern library, comprising the steps of:
          (b)   choosing a tile pattern from the tile pattern library;
          (c)   creating a compositing window within a display area
of a compositor, wherein a first shape of said created compositing window matches a second shape of a periphery of said chosen tile pattern and

wherein said created compositing window is formed by pixels within the display area;

    (d)   decomposing said created compositing window into a first number of *contiguous* tiles, wherein the first number of tiles equals a second number of tiles in said chosen tile pattern and is one of equal to and less than a third number of graphics pipelines, wherein a third shape and a first position of each of the tiles matches a fourth shape and a second position of a corresponding tile in said chosen tile pattern, and wherein each of the tiles is formed by pixels within the display area;

    (e)   assigning each tile of the tiles to a corresponding digital video display unit of a corresponding graphics pipeline of the graphics pipelines; and

    (f)   receiving, at each tile of the tiles, an image output of said assigned corresponding digital video display unit, thereby *spatially compositing* digital video images with the tile pattern library.

Independent claim 14 has been similarly amended.

The Office Action concedes that "Cohn does not specifically disclose that 'assigning each tile to a corresponding digital video display unit of a corresponding graphics pipeline'." (Office Action at p. 3.) However, the Office Action asserts that "such limitations are shown in the 'Background of the Invention' of Applicant's Admitted Prior Art." (Office Action at p. 3.) Applicant disagrees with the Examiner's interpretation of the teachings of Cohn and AAPA.

Cohn does not disclose, teach, or suggest using *contiguous* tiles to render a digital video image as is done in the present invention. To the contrary, Cohn explicitly teaches the use of "whole partitions, segment partitions and cross partitions" to define the tiles in the display area. (Cohn at col. 10, lines 56-60.) Because the "partitions themselves are displayed", Cohn *teaches away* from rendering a digital video image with contiguous tiles. (Cohn at col. 14, line 55.) The displayed partitions of Cohn preclude the tiles of Cohn from being contiguous.

Furthermore, AAPA teaches the use of multiple graphics pipelines for temporal compositing, not for spatial compositing. In *temporal compositing* "[w]here the computer graphics hardware has "n" pipelines, each pipeline processes every n^{th} frame in a sequence of frames. Each pipeline *renders all* of the objects and the background in a single frame." (Specification at p. 3, lines 10-13 (emphasis added).) Temporal compositing is very different from *spatial compositing*, which "uses each pipeline *to render a portion* of each overall frame and combines the output of each pipeline spatially with respect to the location of the rendered portion within the overall frame." (Specification at p. 4, lines 12-15 (emphasis added).)

Thus, neither AAPA nor Cohn, alone or in combination, discloses, teaches, or suggests spatial compositing of contiguous tiles to render a digital video image as performed by the present invention. Therefore, claims 1 and 14 are patentable over Cohn in view of AAPA.

Cohn in View of AAPA, and Further in View of Hashimoto

Claims 2-4, 8-13, and 15-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cohn in view of AAPA, and further in view of U.S. Patent No. 6,515,673 to Hashimoto *et al.* (hereinafter "Hashimoto"). (*See*, Office Action at p. 4.) Applicant respectfully traverses these rejections.

Claims 2-4, 8-13, and 15-23 depend directly or indirectly from independent claims 1 and 14. Hashimoto also does not disclose, teach, or suggest spatial compositing of contiguous tiles to render a digital video image as performed by the present invention. To

the contrary, as was stated at page 7 of the Amendment and Reply filed May 21, 2003:

"Hashimoto pertains to the decomposition of an original three-dimensional image into component polygons. The Hashimoto process does *not* pertain to the rendering of that image." Therefore, claims 2-4, 8-13, and 15-23 are patentable over Cohn in view of AAPA in further view of Hashimoto; and claims 2-4, 8-13, and 15-23 are further patentable in view of their additional distinctive features.

Cohn and AAPA in View of Hashimoto, and Further in View of Smith

Claims 5-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cohn and AAPA in view of Hashimoto, and further in view of U.S. Patent No. 6,223,183 to Smith *et al.* (hereinafter "Smith"). (*See*, Office Action at p. 6.) Applicant respectfully traverses these rejections.

Claims 5-7 depend indirectly from independent claim 1. Smith also does not disclose, teach, or suggest spatial compositing of contiguous tiles to render a digital video image as performed by the present invention. To the contrary, as was stated at page 9 of the Amendment and Reply filed May 21, 2003: "Smith 'relates generally to a method for *describing and indexing* views of multi-dimensional lattice data such as images, video and audio in space, time, frequency and resolution'. (Smith at col. 1, lines 18-21 (emphasis added).)" Therefore, claims 5-7 are patentable over Cohn and AAPA in view of Hashimoto in further view of Smith; and claims 5-7 are further patentable in view of their additional distinctive features.

Cohn in View of Duluk, Jr.

Claims 1-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cohn

in view of U.S. Patent No. 6,552,723 to Duluk, Jr. *et al.* (hereinafter "Duluk"). (*See,* Office

Action at p. 7.) Applicant respectfully traverses these rejections.

Amended independent claim 1 (emphasis added) recites:

A method for spatially compositing digital video images with a tile pattern library, comprising the steps of:

> (b)   choosing a tile pattern from the tile pattern library;
> (c)   creating a compositing window within a display area of a compositor, wherein a first shape of said created compositing window matches a second shape of a periphery of said chosen tile pattern and wherein said created compositing window is formed by pixels within the display area;
> (d)   decomposing said created compositing window into a first number of *contiguous* tiles, wherein the first number of tiles equals a second number of tiles in said chosen tile pattern and is one of equal to and less than *a third number of graphics pipelines*, wherein a third shape and a first position of each of the tiles matches a fourth shape and a second position of a corresponding tile in said chosen tile pattern, and wherein each of the tiles is formed by pixels within the display area;
> (e)   assigning each tile of the tiles to a corresponding digital video display unit of a corresponding graphics pipeline of the graphics pipelines; and
> (f)   receiving, at each tile of the tiles, an image output of said assigned corresponding digital video display unit, thereby spatially compositing digital video images with the tile pattern library.

Independent claim 14 has been similarly amended.

The Office Action concedes that "Cohn does not specifically disclose that 'assigning

each tile to a corresponding digital video display unit of a corresponding graphics pipeline'."

(Office Action at p. 8.) However, the Office Action asserts that "such limitations are shown

in the Duluk, Jr. et al. (Office Action at p. 8.)

"In summary, [Duluk] is a mid-pipeline sorting unit that sorts image data mid-pipeline in a tiled 3-D graphics pipeline architecture." (Duluk at col. 4, lines 44-46.) Duluk teaches "a system 100 for spatially sorting image data in a graphics pipeline" that includes a "3-D graphics processor 117." (Duluk at col. 6, lines 45-47 and 52; and at FIG. 1.) Graphics processor 117 includes a graphics pipeline 200. Graphics pipeline 200 includes a spatial sorting stage 215 positioned sequentially between other processing stages 210 and 220. (*See*, Duluk at col. 7, lines 35-52; and at FIG. 2.) As described in Duluk at col. 12, lines 46-51:

> Sort 215's I/O subsystem architecture is designed around the need to spatially sort image data according to which of multiple, equally sized regions that define the limits of a 2-D window are touched by polygons identified by the image data. Sort 215 is additionally designed around a need to efficiently send the spatially sorted image data in a tile-by-tile manner across I/O bus 216 to a next stage in graphics pipeline 200, or pipeline 200.

FIG. 3 shows a preferred embodiment of sorting stage 215. (*See*, Duluk at col. 8, lines 53-54; and at FIG. 3.) Thus, Duluk implements spatial compositing using *a single graphics pipeline*. In contrast, the present invention implements spatial compositing using *multiple graphics pipelines*. The present invention "*uses each pipeline to render a portion of each overall frame* and combines the output of each pipeline spatially with respect to the location of the rendered portion within the overall frame." (Specification at p. 4, lines 12-15 (emphasis added).) Applicant has amended claims 1 and 14 to draw attention to this distinctive feature more precisely.

Regarding Cohn, as explained above, it does not disclose, teach, or suggest using contiguous tiles to render a digital video image as is done in the present invention. Cohn also does not disclose, teach, or suggest multiple graphics pipelines.

Thus, neither Cohn nor Duluk, alone or in combination, discloses, teaches, or suggests spatial compositing of tiles using multiple graphics pipelines. Therefore, claims 1 and 14 are patentable over Cohn in view of Duluk.

Claims 2-13 and 15-23 depend directly or indirectly from independent claims 1 and 14. Therefore, claims 2-13 and 15-23 are patentable over Cohn in view of Duluk; and claims 2-13 and 15-23 are further patentable in view of their additional distinctive features.
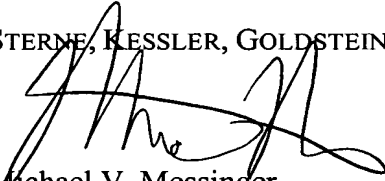
Conclusion

All of the stated grounds of rejection have been properly traversed. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully

requested.

Respectfully submitted,

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